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IN THE
Supreme Court of the United States

OCTOBER TERM, 1977

No. 77-

HUGHES AIRCRAFT COMPANY,
Petitioner,

v.

BELL TELEPHONE LABORATORIES, INCORPORATED,
Respondent.

**PETITION FOR A WRIT OF CERTIORARI TO THE
UNITED STATES COURT OF APPEALS FOR THE
THIRD CIRCUIT**

E. BARRETT PRETTYMAN, JR.
ALLEN R. SNYDER
ROYAL DANIEL
WALTER A. SMITH, JR.
815 Connecticut Avenue, N.W.
Washington, D.C. 20006

DUGALD S. MCDUGALL
MELVIN M. GOLDENBERG
135 South LaSalle Street
Chicago, Illinois 60603

ROBERT THOMPSON
Hughes Aircraft Company
5150 West Century Boulevard
Los Angeles, California 90009

Attorneys for Petitioner

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**PETITION FOR A WRIT OF CERTIORARI TO THE
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Hughes Aircraft Company respectfully petitions for a writ of certiorari to review the judgment of the United States Court of Appeals for the Third Circuit in the above-entitled case.

OPINIONS BELOW

The opinion of the Court of Appeals (App. 25a-30a) is reported at 564 F.2d 654 (3d Cir. 1977). The opinion of the District Court (App. 1a-24a) is reported at 422 F. Supp. 372 (D. Del. 1976).

JURISDICTION

The judgment of the Court of Appeals was entered on October 25, 1977. The jurisdiction of this Court is invoked under 28 U.S.C. § 1254(1).

QUESTIONS PRESENTED

1. Whether the court below erred in holding, contrary to the rule in other Circuit Courts and in the Court of Customs and Patent Appeals, that experimentation which is directed solely to enhancing the commercial desirability and utility of a particular invention, but which is not necessary for the invention's successful reduction to practice, nevertheless constitutes "reasonable diligence" in reducing that invention to practice, as required by 35 U.S.C. § 102(g).

2. Whether the court below erred in holding, contrary to the rule in other Circuit Courts and in violation of important principles of public policy, that inventors may meet their burden of proving "reasonable diligence" through their own uncorroborated, undocumented oral testimony and other noncontemporaneous evidence, particularly in cases where they were aware of the need for full contemporaneous documentation, where they created no such documentation, and where they even destroyed some of the requisite documents.

STATUTES INVOLVED

35 U.S.C. § 291. Interfering Patents

The owner of an interfering patent may have relief against the owner of another by civil action, and the court may adjudge the question of the validity of any of the interfering patents, in whole or in part. * * *

35 U.S.C. § 102(g). Conditions for Patentability; Novelty and Loss of Right to Patent

A person shall be entitled to a patent unless—

* * *

(g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who is first to conceive and last to reduce to practice, from a time prior to conception by the other.

STATEMENT

In May of 1966, Hans Dill, an employee of Hughes Aircraft Company ("Hughes"), invented a novel and useful method of making very small transistors from semiconductor material. Much effort was expended at Hughes over the next five months to establish the feasibility of Dill's invention, and a patent on it was applied for by Hughes on October 26, 1966.

Dill's invention was the process of making a "silicon-gate field effect transistor" ("SGFET"), a type of electronic amplifier for integrated circuitry. Because such devices are so small (several thousand per square inch), they are especially valuable for use in computers and sophisticated calculators. The United States Patent and Trademark Office subsequently issued Hughes a patent on this invention.

On March 27, 1967—over one year after it had conceived the invention and five months after Hughes filed its patent application—Bell Telephone Laboratories, Inc. ("Bell"), applied for a patent on a process substantially identical to the Hughes invention, and the Patent Office also issued a patent to Bell.¹

¹ In the proceedings below, the Bell patent was referred to as the "Kerwin patent," after the first named inventor in the patent application. In like manner, the name of the Hughes inventor, Dill, was used to identify the Hughes patent.

Nearly four years after it had learned of the existence of the Hughes patent (J.A. 11),² Bell brought this action against Hughes in the United States District Court for the District of Delaware, alleging that the Hughes patent interfered with Bell's patent, and that Bell should be declared the prior inventor, pursuant to 35 U.S.C. § 291.³

At trial, the existence of an interference was not disputed, and so priority of invention was the major legal question. Under 35 U.S.C. § 102(g), the law presumes that the first inventor to reduce the invention to practice (in this case, Hughes) has priority, *unless* the rival inventor can prove that he was first to conceive the invention *and* that in preparing his patent application or otherwise reducing his invention to practice, he exercised "reasonable diligence" from prior to the time the other inventor conceived the same idea.

The parties stipulated (J.A. 12) that Hughes employee Dill conceived the disputed invention on May 1, 1966, and reduced it to practice by filing a patent application on October 26, 1966. After noting the stipulation (App. 4a), the District Court found that Bell employees conceived the invention in February or March 1966—prior to Hughes—but had not reduced it to practice until well after Hughes—sometime in December 1966 or January 1967. App. 17a. Thus, under 35 U.S.C. § 102(g), the issue before the lower courts was whether Bell could meet its burden of proving that it exercised "reasonable diligence" in reducing its conception to prac-

² Record citations throughout this Petition will be to the Joint Appendix ("J.A.") filed by the parties in the Third Circuit. "App.," on the other hand, refers to the Appendix to this Petition.

³ Bell made the same claim in the District Court against the General Instrument Corporation ("GI"), alleging that GI's patent also interfered with the Bell patent. In a separate lawsuit, however, Hughes had successfully established its seniority over GI, and hence GI withdrew from this litigation, allowing a default judgment to be entered against it.

tice during the entire period between May 1, 1966, the date Hughes conceived this invention, and approximately January of 1967, the time Bell reduced the invention to practice.

At trial Bell's employees testified that they were absorbed through June in trying to make a workable device. They then postponed completion of testable devices in favor of experimentation directed at collateral goals. One of the inventors conceded that they could have completed the devices at any time after June, using conventional techniques (J.A. 108-109), and the court so found. App. 10a. Instead, the inventor testified that Bell's goal from July forward was "to make the transistor more optimum." J.A. 161. One desired improvement was the elimination of hysteresis, a form of electrical instability which, as the trial court found, would not prevent the invention from being reduced to practice, but which would make it somewhat less desirable commercially. App. 11a. During the early fall, the only one of Bell's inventors who was then working on the silicon-gate project concentrated exclusively on that hysteresis problem. App. 10a; J.A. 495-501.

Hughes contended that since the work on hysteresis was directed to commercial enhancement, rather than reduction to practice, such work could not, as a matter of law, be deemed "reasonable diligence" under 35 U.S.C. § 102(g). The District Court, however, rejected that contention and held, contrary to the legal rule in the cases cited by Hughes, that Bell's "work on problems inhibiting commercial utilization of the process should be deemed reasonable diligence * * *." App. 19a n.19.

In trying to show its reasonable diligence for the rest of the fall and early winter of 1966, Bell relied almost exclusively on the oral testimony of the inventors, in view of a lack of documentation covering the period at issue. One especially noteworthy gap in the documenta-

tion concerns the laboratory notebook of Mr. Sarace (Plaintiff's Exhibit 16), covering a period when he was the only Bell employee working on the project full-time. His entries occurred almost daily and were quite detailed for the months of September and part of October, but they stopped abruptly and without explanation on October 17, 1966. The entries commenced again with a note for January 17, 1967. To reconstruct the events of the period between October 17 and some time in December, when the trial court held that reduction to practice may have occurred, Bell relied upon the almost ten-year-old recollections of the Bell inventors themselves, and of their co-workers, without the benefit of any written chronicle of Bell's activities.

The trial court required no further proof of effort, and held on the basis of that evidence that Bell had met its burden to prove reasonable diligence, even in the absence of contemporaneous documentation on the point. Judgment was entered in favor of Bell.

The Court of Appeals held that the trial court had used the proper legal standards in considering these issues, that the findings of fact were not "clearly erroneous," and that the judgment should be affirmed. App. 28a-30a.

REASONS FOR GRANTING THE WRIT

Introduction

One of the fundamental principles of our patent system is that whenever there are two separate, independent inventors of a single invention, the law will presume that the first to file a patent application was the prior inventor. That presumption is designed to reward the one who promptly discloses for the benefit of the public the new thing that has been invented. The inventor who files

second generally receives no such reward because he has brought no additional benefit to the public. However, the second to file may nevertheless be accorded priority if he can prove that (a) he was first to conceive the invention, and (b) even though he was second to file his application or otherwise reduce the invention to practice, he did exercise "reasonable diligence" in accomplishing such reduction to practice. 35 U.S.C. § 102(g).

Until the decision of the Third Circuit in this case, the law had been well-settled—and all inventors had plainly been on notice—regarding two critical aspects of the "reasonable diligence" standard. The first was that the requisite diligence related solely to those activities specifically directed toward reducing the invention to practice; in other words, delay in filing for a patent could not be justified by time and efforts expended either in enhancing the commercial utility of the invention or in improving auxiliary features not directly related to the goal of reducing the invention to practice. And the other established tenet in the law of diligence was that an inventor claiming priority by virtue of an asserted earlier conception and reasonably diligent reduction to practice bore a heavy burden of proof in establishing such a claim—a burden that could not be sustained by self-serving testimony or noncontemporaneous documents of the inventor himself, without independent corroboration.

As discussed more fully hereinafter, the decision of the courts below is contrary to both those settled principles. It creates serious uncertainty and instability as to matters of far-reaching importance, affecting both the conduct of potential inventors and the hoped-for benefits to the public, and it conflicts with the hitherto unquestioned decisions of other Circuits and the Court of Customs and Patent Appeals. Such a conflict is particularly troublesome in the field of patent law, where the

parties involved are frequently amenable to suit in many different jurisdictions, and the risk is therefore great that the considerable public and private interests involved will be settled by means of forum-shopping. Thus, the decision below warrants review by this Court. See *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 472 (1973); *Brenner v. Manson*, 383 U.S. 519, 522 & n.4 (1966).

Furthermore, a second threat is posed by the lower courts' opinions in this case—one which standing alone is of sufficient public concern to merit this Court's attention. The courts below have approved the use of interested parties' uncorroborated oral recollections as a basis for resolving a multi-million dollar patent dispute. They have so ruled in a case in which the prevailing party is a sophisticated, patent-wise corporation that failed to record some vital parts of the contemporaneous invention history and destroyed the records originally made respecting other parts. This unprecedented decision threatens to foster litigation, and to invite perjury and destruction of evidence, in an area of law where the public interest is so great that no such risk should be tolerated.

1. The Circuit Court's holding that reasonable diligence may consist of work unrelated to reduction to practice conflicts with the rule in other Circuits and with fundamental principles of patent law.

The Third Circuit and the District Court have held in this case that inventors' work on problems related solely to commercial utilization, and not to reduction to practice, can be deemed "reasonable diligence" in reducing an invention to practice within the meaning of 35 U.S.C. § 102(g). That holding is in direct conflict with the well-established position of the United States Court of

Customs and Patent Appeals, as well as with the position of every other Circuit Court that has considered this issue.⁴

It has long been the law that "a discoverer or inventor, in order to get a patent for a process, [need not] have succeeded in bringing his art to the highest degree of perfection." *The Telephone Cases*, 126 U.S. 1, 536 (1888). Indeed, so long as the invention "performs, though only in a crude way, the important function by which it makes the substantial change claimed for it in the art, it is enough." *Hildreth v. Mastoras*, 257 U.S. 27, 34 (1921). As a consequence of this basic principle, it has been universally recognized that developing the commercialization or marketability of an invention is neither a part of its reduction to practice nor a prerequisite to its patentability.⁵

Any other rule would have been at war with the underlying purposes of our patent system, which is con-

⁴ The Third Circuit itself previously agreed with the position urged by Petitioner here. Judges Biggs, Goodrich, Kalodner, Magruder and Maris so held in two previous cases. *S&S Corrugated Paper Mach. Co. v. George W. Swift, Jr., Inc.*, 176 F.2d 358 (3d Cir. 1949); *Riche v. Permutit Co.*, 135 F.2d 922 (3d Cir. 1943), *aff'd* 47 F. Supp. 275 (D. Del. 1942). The instant case necessarily overrules these 30-year-old rulings.

⁵ *E.g.*, *Cody v. Aktiebolaget Flymo*, 452 F.2d 1274, 1283 (D.C. Cir. 1971), *cert. denied*, 405 U.S. 990 (1972); *Kardulas v. Florida Machine Products Co.*, 438 F.2d 1118, 1121 (5th Cir. 1971); *Sutter Products Co. v. Pettibone Mulliken Corp.*, 428 F.2d 639, 647 (7th Cir. 1970); *Farrand Optical Co. v. United States*, 325 F.2d 328, 332-333 (2d Cir. 1963); *Douglas v. United States*, 510 F.2d 364, 366 (Ct. Cl.), *cert. denied*, 423 U.S. 825 (1975); *Mattor v. Coolegem*, 530 F.2d 1391, 1395 (C.C.P.A. 1976); *Cochran v. Kresock*, 530 F.2d 385, 391 (C.C.P.A. 1976); *Application of Anthony*, 414 F.2d 1383, 1396 (C.C.P.A. 1969); *Fleming v. Bosch*, 181 U.S.P.Q. 761 (Bd. Pat. Intf. 1973); *Gunn v. Bosch*, 181 U.S.P.Q. 758 (Bd. Pat. Intf. 1973).

The Board of Patent Interferences is the important administrative tribunal that has day-to-day responsibility for carrying out the dictates of the statute. 35 U.S.C. § 135.

stitutionally required to "promote the Progress of Science and useful Arts * * *." U.S. Const. Art. I, § 8, cl. 8. It does so by securing to an inventor the exclusive right to exploit his advancement of human knowledge for a limited time. Such a grant is not designed to secure to the inventor any natural property right in his discoveries, but rather to induce him to disclose fully his new knowledge for the public benefit. *Graham v. John Deere Co.*, 383 U.S. 1, 9 (1966). It is through that full disclosure that the system "stimulates ideas and the eventual development of further significant advances in the art." *Kewanee Oil Co. v. Bicron Corp.*, *supra*, 416 U.S. at 481.

Thus, achievement of the constitutionally-envisioned "Progress of Science and useful Arts" depends on prompt reduction to practice and disclosure to the public of that which is new and useful. The constitutional goal of "Progress" would not be attained if inventors could with impunity withhold their discoveries from the eyes of others while these discoveries are being refined and perfected for commercial exploitation before reduction to practice.

That is why the law denies priority to any inventor who was not the first to reduce the disputed invention to practice unless (a) he can *prove* that he was the first to conceive the invention, and (b) he can *also* prove that he was "reasonably diligent" in reducing the invention to practice. 35 U.S.C. § 102(g). And until the present case, the courts unanimously have measured the second inventor's diligence *only* by the work he did that was actually directed to reducing the invention to practice. Thus, except for the decision of the Third Circuit in this case, the rule in every other tribunal which has considered the matter is that work which advances an invention-project overall, but which is not directed to reducing to practice

the specific invention for which the patent is claimed, necessarily cannot be considered "reasonable diligence."⁶

The rulings below are in square conflict with these cases.⁷

⁶ *E.g.*, *Abbott v. Shepherd*, 135 F.2d 769, 779 (D.C. Cir. 1942); *Eclipse Mach. Co. v. E. Krieger & Son, Inc.*, 78 F.2d 755 (2d Cir. 1937); *Litchfield v. Eigen*, 535 F.2d 72, 76 (C.C.P.A. 1976); *Fitzgerald v. Arbib*, 268 F.2d 763, 766 (C.C.P.A. 1959); *Smith v. Hayward*, 176 F.2d 914 (C.C.P.A. 1949); *Burns v. Curtis*, 172 F.2d 588, 591 (C.C.P.A. 1949); *Thompson v. Dunn*, 166 F.2d 443, 446-447 (C.C.P.A. 1948); *Fleming v. Bosch*, *supra*; *Gunn v. Bosch*, *supra*.

⁷ The following language is typical of the proposition in the cases cited above that it is not enough for the first conceiving party to have spent its time clearing up technical or troublesome details that did not go to the basic premise of the invention, or to have worked on the potential commercial utilization of the invention:

They admit that [during the period at issue], they did not test glutaraldehyde *in vivo*; in other words, during that period, none of their activity was directed toward reducing their invention to practice. It is of no avail to them that their activities were continuously "directed to the project" of testing numerous compounds for anti-caries activity * * *. [*Litchfield v. Eigen*, *supra*, 535 F.2d at 76.]

* * *

[W]hatever had been done by [Smith] towards promoting the commercial exploitation of the device during that period does not constitute a matter to be considered on the issue of appellant's diligence * * *. [*Smith v. Hayward*, *supra*, 176 F.2d at 922.]

* * *

[P]reparation of samples of specimens which exhibit the Gunn effect, experiments relating to the characteristics exhibited by the samples, and construction of equipment used in the experiments on the samples * * * does not indicate reasonable diligence * * *. [*Gunn v. Bosch*, *supra*, 181 U.S.P.Q. at 761.]

* * *

Similarly, these tribunals have used quite specific and uniformly adamant language to the effect that the first conceiving party, in order to meet the "reasonable diligence" test under the statute, had to have been working toward a reduction to practice of the invention at hand (or toward filing an application for the patent):

Diligence consists in reasonable effort directed toward embodiment of an invention in physical form or toward filing

The decisions in two of the cases cited above, *Abbott v. Shepherd* and *Thompson v. Dunn*, both *supra* note 6, illustrate the direct conflict now existing between the District of Columbia Circuit and the Court of Customs and Patent Appeals, on the one hand, and the Third Circuit on the other.

Abbott presented a situation almost identical to the present case. There, two inventors competed for a patent on a process for weaving flexible yarn into cloth. The party with the burden of proving "reasonable diligence" had experimentally demonstrated that his process was workable. However, instead of immediately thereafter performing the practical weaving tests necessary for actual reduction to practice, the inventor spent the next nine months refining a particular facet of the formula which was not part of the invention and was not essential for reduction to practice. The District of Columbia Circuit declared that, as a matter of law, such activity was not reasonable diligence:

However necessary and convincing that activity might have been if the invention claimed had been in the specific formula it finally developed, in relation to the invention in issue it was at most an artisan's sidetrack where the inventor had no business to be when others were coming along the main line. Perfection of utility is to be encouraged. But delay, while one is engaged only in what is already

an application for the patent. [*Eclipse Mach. Co. v. E. Krieger & Son, Inc.*, *supra*, 87 F.2d at 757.]

* * *

[A]ppellant's activity relative to other devices was of no assistance to him in reducing [his invention] to practice * * *. [*Smith v. Hayward*, *supra*, 176 F.2d at 922.]

* * *

The work relied on must be directed to attaining a reduction to practice of the subject matter of the counts. [*Gunn v. Bosch*, *supra*, 181 U.S.P.Q. at 761.]

known to the art after the essential idea has been proved, is not that diligence which is required to secure priority in invention. [135 F.2d at 779; footnote omitted.]

Thompson v. Dunn presents the same situation. There, the priority contest was over a fruit handling machine which, among other things, could be used for more effectively peeling fruit. However, the invention itself contained no peeling mechanism, but only devices for feeding and impaling the fruit. During the period when reasonable diligence was required, the inventor seeking priority had spent time "attempting to develop a *pear peeling mechanism* which, it was thought, would operate more satisfactorily from a commercial standpoint in conjunction with his conception of the invention * * *." 166 F.2d at 446; emphasis in the original. The Court of Customs and Patent Appeals concluded that such efforts relating to "commercial expediency" could not, as a matter of law, constitute diligence:

It is evident from the board's decision that it was of opinion that work done on any part of the completed machine, although not on the elements defined by the involved counts, constituted diligence by appellee in reducing to practice the invention here involved. We are not of that opinion. It is apparent from the record that appellee and his associates contemplated modifications in their peeling mechanism and proceeded to perfect such a mechanism before appellee attempted to reduce to practice the feeding and impaling mechanism called for by the counts in issue. In so doing, appellee, of course, is not open to criticism. It is well settled, however, that diligence will not wait upon commercial expediency. [166 F.2d at 446.]

Though the instant case involves the same issue addressed by the District of Columbia Circuit and the Court of Customs and Patent Appeals, the Third Circuit has

resolved it in precisely the opposite way. The District Court in this case concluded that only one Bell inventor (Sarace) worked on the transistor process during the second half of 1966, and that from some time in late August until some time in late November he was primarily experimenting with an electrical instability (hysteresis) problem.* The judge further determined that although hysteresis was a "deficiency which it was desirable to overcome," it "*would not have precluded a successful reduction to practice.*" App. 11a (emphasis added).⁹

Hughes contended before the District Court and again before the Court of Appeals that, on such facts, time spent pursuing a solution to the hysteresis problem could not be credited as reasonable diligence in reducing the invention to practice. The District Court nevertheless held that:

In this Court's view, the silicon gate process, as it existed in the fall of 1966, cannot be readily subjected to rigid compartmentalization. Accordingly, Sarace's work on problems inhibiting commercial utilization of the process should be deemed reasonable diligence, whether that work encompassed the whole of the process, one step in the process, or an ultimately abandoned step. [App. 19a n.19.]

The trial court thus determined that efforts unrelated to reducing the invention to practice can be deemed "reasonable diligence" within the meaning of the patent laws,

* As will be subsequently discussed, there is no way of determining what was being done or when and by whom it was being done during much of this period because there were no objective, contemporaneous documents produced on the matter. However, solely for purposes of the present discussion, we do not challenge the District Court's findings as to what actually occurred.

⁹ Bell conceded as much. It stated on page 31 of its main brief filed with the District Court that "the hysteresis effect found in transistors * * * *has nothing to do with the success or failure of the process used to fabricate the transistors*" (emphasis added).

so long as those efforts somehow were connected to the project as a whole or were directed to enhancing the commercial utility of the invention.¹⁰ The Third Circuit affirmed the District Court's departure from established legal standards, and upheld its findings of fact made under the more expansive standard. App. 28a.¹¹ The lower courts' decisions are completely at odds with the previously discussed principles of patent law and with every other tribunal that has considered the issue.

¹⁰ The court's statement that the various efforts relating to the overall invention-project could not be "readily subjected to rigid compartmentalization" is immaterial to the legal issue Petitioner is raising before this Court. The only "compartmentalization" at issue is the separation of these efforts which *were* directed to reducing the invention to practice from those that were *not*. The court itself performed such a compartmentalization to the extent of finding that efforts devoted to the hysteresis problem were *not* directed to reduction to practice. App. 11a. It thus erred as a matter of law in nevertheless treating those efforts as part of the "reasonable diligence" requirement.

Even if the District Court's "compartmentalization" reference were relevant—which it is not—it ignores the rule of law established without exception that the party attempting to prove "reasonable diligence" itself carries the burden of proving such diligence by a preponderance of the evidence, and if its own proof *cannot* compartmentalize the relevant time period, so that each piece of work and each time sequence can be accounted for, such party fails in its proof. *E.g.*, *Gould v. Schawlow*, 363 F.2d 908, 916 n.6, 918, 921 (C.C.P.A. 1966), and cases cited *supra* notes 5 and 6. "The party chargeable with diligence must account for the entire period during which diligence is required." *Gould v. Schawlow*, *supra*, 363 F.2d at 919.

¹¹ On appeal, the Third Circuit rejected Hughes' contention that the efforts directed toward solving the hysteresis problem had to be excluded from "reasonable diligence" consideration as a matter of law. Notwithstanding the District Court's factual determination that the hysteresis-related work was not necessary to reducing the invention to practice, the Third Circuit nevertheless affirmed the District Court's decision by finding such work "sufficiently within that area [of reduction to practice] to constitute reasonable diligence." App. 28a. The court therefore did not simply affirm findings of fact; it necessarily approved the broader, unprecedented legal standard of "reasonable diligence" as adopted by the District Court.

In addition to presenting a conflict between Circuits—with all its attendant potential for forum-shopping and confusion in the application of a federal statute—the Third Circuit decision threatens serious harm to our basic patent system of encouraging technological advancement for the public good. If an inventor who is first to conceive an advancement were assured that he could not be foreclosed from a patent by those who thereafter enter the field, he has, inherently, less incentive to reduce to practice and eventually to disclose his invention in a patent. Indeed, so long as work related to the invention-project is in some manner continued, even though disassociated from the patentable improvement, an inventor under such a rule of law could effectively monopolize an inventive area for as long as he chose. He would not be subject to the policy of the patent law encouraging swift disclosure; he would not need to share his advancement so that others might be stimulated to advance the art still further; and he would be able to extend almost indefinitely the expiration date of his statutory patent term. The public would be the loser.¹²

¹² Obviously, the rate of progress of technological development would be greatly impeded if inventors could deny the fruits of their work to colleagues. The technological area of the SGFET itself presents a good example of the need for rapid interchange of ideas to spur technological growth. According to the Patent Office, some 2181 patents have been granted to inventors in the narrow technological field in which the SGFET invention is classified. Of these, 75% (1531) were issued on applications filed after Hughes made its application in late 1966. Thereafter, around 160 applications that ultimately matured into patents were filed each year through 1974. Quite clearly, the rapid progress of this art depended upon prompt disclosure of prior innovations to others and the diligence of inventors in filing their applications. United States Department of Commerce, Patent & Trademark Office, Office of Technology Assessment & Forecast [hereafter OTAF], *Special Report on SGFE Transistors 6* (1978).

2. The Circuit Court's decision relying on noncontemporaneous evidence from inventors to prove "reasonable diligence" conflicts with the rule in other Circuits and violates public policy.

A. There is a conflict in the Circuits.

The Third Circuit acknowledged in its opinion below the general rule that "uncorroborated testimony of an inventor on essential issues of priority is highly suspect and such testimony should, therefore, generally be supported by corroborating evidence * * *." App. 29a. What the appellate court ignored, however—and indeed compounded—is the considerable confusion that exists in this area of law as a result of the conflict between the different Circuit Courts concerning the type of corroboration required by this rule.

As the Court of Customs and Patent Appeals has summarized the basic principle, "in interference cases a claimant, no matter how honest and truthful he may be, cannot prevail upon the basis of his own oral testimony standing alone. The rule which requires corroborating evidence is inviolable * * *." *Allen v. Blaisdell*, 196 F.2d 527, 529 (C.C.P.A. 1952). The interpretation and application of this general principle, however, have produced widely divergent rules in the various Circuits.

Some courts—including those in the First and Fourth Circuits, the Court of Claims, and, in some instances, the Court of Customs and Patent Appeals—hold that an inventor's own documentary evidence will not suffice as "independent" corroboration for his oral testimony. These courts reason that such evidence is self-serving in the same way that the inventor's oral testimony is self-serving, that it suffers from the same infirmities that make such oral testimony unreliable, and that it there-

fore cannot be characterized as being the requisite independent corroboration.¹³

Likewise insufficient under this approach is oral testimony either by the inventor's co-workers, *Rex Chainbelt, Inc. v. Borg-Warner Corp.*, 477 F.2d 481, 490-491 (7th Cir. 1973), or by witnesses who possess no independent knowledge regarding the inventor's alleged activities but who simply relied on what the inventor previously had told them.¹⁴

The Court of Claims, in its recent decision in *Lockheed Aircraft Corp. v. United States*, *supra*, summarized the rule in these cases:

[I]t is well established that the burden of proof of an inventor's alleged conception and reduction to practice is a heavy one requiring full corroboration by other than the inventor's own self-serving testimony or records. In fact, this court has held that oral recollections of long past events, unsupported by contemporaneous documentary evidence, are insufficient to meet the strict burden of proof required. [553 F.2d at 74; emphasis added; citations omitted.]

However, other courts, namely those in the Second and Sixth Circuits, and, on occasion, the Court of Cus-

¹³ E.g., *Potter Instruments Co. v. ODEC Computer Systems, Inc.*, 370 F. Supp. 198, 206 (D.R.I.), *aff'd*, 499 F.2d 209 (1st Cir. 1974); *Cleeton v. Hewlett-Packard Co.*, 343 F. Supp. 1215, 1221 (D. Md. 1972), *aff'd*, 475 F.2d 1399 (4th Cir. 1973); *Lockheed Aircraft Corp. v. United States*, 553 F.2d 69, 74 (Ct. Cl. 1977); *Senkus v. Johnston*, 166 F.2d 597, 599 (C.C.P.A. 1948); *Thurston v. Wulff*, 164 F.2d 612, 617 (C.C.P.A. 1947); *Crane v. Carlson*, 125 F.2d 709, 712-713 (C.C.P.A. 1942).

¹⁴ *Laminex, Inc. v. Fritz*, 389 F. Supp. 369, 383 (N.D. Ill. 1974); *Gortatowsky v. Anwar*, 442 F.2d 970, 971-972 (C.C.P.A. 1971); *Gould v. Schawlow*, *supra*, 363 F.2d at 919-920; see *Globe-Union, Inc. v. Chicago Telephone Supply Co.*, 103 F.2d 722, 730 (7th Cir. 1939).

toms and Patent Appeals, have concluded that an inventor's contemporaneous documentary evidence may be legally sufficient to corroborate his oral recollections, and that such evidence should be judged by a "rule of reason."¹⁵ Illustrative of this approach is the following language from the court's opinion in *Ritter v. Rohm & Haas Co.*, *supra*:

When the validity of a patent turns on the exact date a certain event occurred, or discovery was made, there is an inherent risk of perjury if after-the-fact oral testimony by the most interested party, the alleged inventor, can carry the invention date back beyond the filing date.

* * * [The inventor's] notebook, a document of uncontested authenticity, is a contemporaneous record of his thoughts and actions. It is hard to imagine what more reliable corroborative evidence could be found.

* * *

Memories are fallible, particularly in trying to recall the precise date of long forgotten events whose importance is only subsequently created by the Byzantine nuances of litigation. To rule out [the inventor's] notebook on the ground that it is "self-serving" is to exalt labels over reason. [271 F. Supp. at 320, 321; footnote omitted.]

Faced with these directly conflicting interpretations of the corroborative evidence rule, the Third Circuit in the instant case took still another approach. Declaring that "corroborating evidence need not take any particular form" (App. 29a), the appellate court affirmed the

¹⁵ *Campbell v. Spectrum Automation Co.*, 513 F.2d 932, 937-938 (6th Cir. 1975); *United Shoe Machinery Corp. v. Brooklyn Wood Heel Corp.*, 77 F.2d 263 (2d Cir. 1935); *Ritter v. Rohm & Haas Co.*, 271 F. Supp. 313, 320-321 (S.D.N.Y. 1967); *Breuer v. De Marinis*, 558 F.2d 22, 29 (C.C.P.A. 1977); *Mikus v. Wachtel*, 542 F.2d 1157, 1159-60 (C.C.P.A. 1976).

trial judge's holding that oral testimony of inventors is sufficiently corroborated if supported by oral testimony of co-inventors and by *noncontemporaneous documents* prepared by the inventors themselves.¹⁶

By concluding that such evidence was legally sufficient to prove Bell's case, the Third Circuit not only has taken a stance in conflict with the *per se* rule in the First and Fourth Circuits and the Court of Claims, but it has confirmed a case far outside the "rule of reason" approach of the Second and Sixth Circuits. In so doing, the Third Circuit has unacceptably lowered the standards the law should require, and it has injected still more uncertainty into a critical area that can ill afford such ambiguity.

B. Under facts such as are present here, public policy requires a rule prohibiting any consideration of inventors' noncontemporaneous evidence as proof of "reasonable diligence".

The instant case demonstrates graphically the need for a new rule which will prevent large corporations, with extensive patent experience and expertise, from calling upon the courts to evaluate inherently unsatisfactory oral testimony from inventors in order to resolve complex, multi-million dollar controversies over patent priority.¹⁷

¹⁶ The District Court's "corroborative evidence" included solely testimony from inventors (Sarace and Kerwin) and a co-worker (Edwards), plus two exhibits, both authored by the inventors. App. 12a n.13. One exhibit was a set of viewgraph slides of a talk given by Sarace in December 1966, and the other was a January 1967 intra-company memorandum. The first merely described the device and the second was a report on the status of work as of January. Neither exhibit related at all to the key question of what, if any, effort Bell expended on the project in the late fall of 1966.

¹⁷ Such controversies are increasing. In 1976, the United States Patent and Trademark Office received over 100,000 applications for patents on mechanical, electrical, or chemical inventions, as compared with 76,500 in 1958. United States Department of Com-

Petitioner submits that the public interest in efficient and just administration of the patent laws requires that the current, conflicting versions of the corroborative evidence rule be modified so as to require that *only* contemporaneous, documentary evidence will suffice to prove prior inventive efforts, at least in cases, such as the instant controversy between Bell and Hughes, where the following three factors are present:

1. *A large, patent-wise corporation*—Bell is a sophisticated and experienced inventor. It employs hundreds of highly skilled scientists whose sole job is to create new devices and reduce them to practice.¹⁸ Unlike the untutored technician working in his basement on his first invention, Bell and its employees are well aware from long experience of the necessity to document in detail every step in the inventive process. The company has been involved in numerous administrative and judicial battles over disputed inventions and is thus fully cognizant of the applicable requirements for proving inventive priority, reduction to practice and reasonable diligence.

merce, Patent & Trademark Office, *Annual Report of the Commissioner of Patents* 10 (1976). Approximately 9 per cent of such patents become involved in public protests, and a smaller number, around 1 per cent, become involved in interferences. United States Department of Commerce, Patent & Trademark Office, *Annual Report of the Commissioner of Patents* 1 (1975).

¹⁸ The Patent Office reports that even in the narrow area covered by the patent in this case, Bell owns 96 patents, issued between 1963 and 1976. Only six other corporations have as many, including IBM, RCA and foreign-owned electronics companies. The patent in this case was only one of 15 that Bell received from applications filed on the SGFET technology in 1967. In 1969, when SGFET-related patents were first issued, Bell received 16, second only to IBM's 18. Bell consistently ranks at or very near the top in the nation for the number of patents owned in broader or related fields, such as Color Television (second after RCA), semiconductor computer memories (shares second place with others), and magnetic bubble computer memories (first with 48% of all patents). OTAF, *Special Report on SGFE Transistors* 6, 8 (1978); OTAF, *Special Report on Color Televisions* 8 (1977); OTAF, *Seventh Annual Report* 96, 118, 126, 144 (1977).

It not only admits but is proud of this fact. According to its own policy announcements, Bell is a careful keeper of records. Defendant's Exhibits 12, 13. This attention to detail is attested to by the fact that it did keep elaborate records of its work on this patent until October 17, 1966. J.A. 504.

2. *A gap in the documentation*—The District Court held that Bell presented to the court *no contemporaneous documentation* at all on its activities covering the important "reasonable diligence" period from October 17, 1966, until at least December 1966. App. 12a.

3. *Destruction of records*—It is undisputed pursuant to Bell's own evidence that important documents relating to the "reasonable diligence" period were destroyed and thus never presented in court. *E.g.*, J.A. 173-174, 242.¹⁹

Petitioner submits that when an inventor is aware of the necessity of keeping records, when it then totally fails to keep such records for a substantial amount of "reasonable diligence" time, and when the inventor later goes so far as to destroy records covering this crucial time period, public policy demands that *no noncontemporaneous evidence of any kind* be allowed to fill the "reasonable diligence" void. To hold otherwise would be to invite both perjury and the destruction of adverse documents.²⁰

¹⁹ For present purposes it makes no difference *why* the documents were destroyed; the key point is that they were in fact done away with. However, it is interesting that while Bell at first claimed that its documents were destroyed pursuant to its "document retention policy" (J.A. 242), it was then proven that the destruction was in fact in defiance of that policy. Bell's General Executive Instructions concerning the preservation of records (Defendant's Exhibit 12) required that laboratory notebooks be maintained for 30 years after the last entry, that laboratory reports be kept for 20 years, and that technical memoranda be kept permanently.

²⁰ Even in the absence of the special circumstances referred to above, this Court has repeatedly emphasized the unsatisfactory

We do not charge that fraud occurred in this case. Rather, the rule we seek simply takes account of the realities of the situation in which the witness, not subject to contradiction by contemporaneous documents, finds himself.²¹ The point is that a rule allowing valuable—

nature of oral testimony from an inventor trying to prove, years after the event, that he had effectively reduced to practice an invention for which another held a prior patent. See *The Barbed Wire Patent*, 143 U.S. 275, 284-285 (1892):

In view of the unsatisfactory character of such testimony, arising from the forgetfulness of witnesses, their liability to mistakes, their proneness to recollect things as the party calling them would have them recollect them, aside from the temptation to actual perjury, courts have not only imposed upon defendants the burden of proving such devices, but have required that the proof shall be clear, satisfactory and beyond a reasonable doubt.

* * *

The very fact, which courts as well as the public have not failed to recognize, that almost every important patent, from the cotton gin of Whitney to the one under consideration, has been attacked by the testimony of witnesses who imagined they had made similar discoveries long before the patentee had claimed to have invented his device, has tended to throw a certain amount of discredit upon all that class of evidence, and to demand that it be subjected to the closest scrutiny.

²¹ See *Deering v. Winona Harvester Works*, 155 U.S. 286, 300-301 (1894):

As we have had occasion before to observe, oral testimony, unsupported by patents or exhibits, tending to show prior use of a device regularly patented is, in the nature of the case, open to grave suspicion. *The Barbed Wire Patent*, 143 U.S. 275. Granting the witnesses to be of the highest character, and never so conscientious in their desire to tell only the truth, the possibility of their being mistaken as to the exact device used, which, though bearing a general resemblance to the one patented, may differ from it in the very particular which makes it patentable, are such as to render oral testimony peculiarly untrustworthy; particularly so if the testimony be taken after the lapse of years from the time the alleged anticipating device was used. If there be added to this a personal bias, or an incentive to color the testimony in the interest of the party calling the witness, to say nothing of downright perjury, its value is, of course, still more seriously impaired.

sometimes astronomically valuable²²—patent rights to turn on vague, uncertain and speculative evidence produced years after the event invites litigation, raises at least the spectre of possible fraud, perjury or destruction of documents, and thus casts doubt on the whole adjudicative process.

Just as this Court and lower courts have not hesitated in other cases to bar evidence or to set standards on grounds of public policy because of the *possibility* of misconduct,²³ so here the Court should announce clearly and

²² The dollar value of a patent is difficult to determine because owners keep the data confidential and because the calculations present many accounting problems. However, figures are available on the manufacture of all semiconductor devices, and the tremendous growth and dollar volume they disclose are good measures of the economic importance of the technological developments disputed here. In 1958, semiconductor devices were a \$250 million industry. Nine years later, when Bell filed its patent application, the industry had more than quadrupled to \$1.14 billion. By the time judgment was rendered in this case nine years later, the industry had almost quadrupled again, to \$4.47 billion, or about a quarter of one per cent of the whole economy. During the period from 1958 to 1976, semiconductor manufacturing grew 1687 per cent, six times faster than the economy as a whole. United States Department of Commerce, Bureau of the Census, *Census of Manufactures*, Industry Series Table 1a for SIC 3674 (1967); United States Department of Commerce, Bureau of the Census, *Annual Survey of Manufactures*, Industry Series Table 1a for SIC 3674 (1976); United States Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, Table 1 (Dec. 1959); United States Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, Table 1 (Dec. 1977). In this field, patent priority disputes are of great importance both because of the amount of money currently at issue and because of potential profit growth.

²³ For example, in *Hodgson v. Humphries*, 454 F.2d 1279 (10th Cir. 1972), an enforcement action under the Fair Labor Standards Act, testimony in lieu of legally required documents was held inadequate and inadmissible, where the employer had failed to create the documents. See also *Bergdoll v. Pollock*, 95 U.S. 337, 341 (1877) ("Certainly the law does not contemplate that [the defendant] may relieve himself from the effect of insufficient or improper [book-keeping] entries by a resort primarily to the uncertain recollection or knowledge of witnesses * * *"). Various other exclusionary rules

strongly that an inventor in the position of Bell cannot carry its burden of proof by other than contemporaneous evidence. Given such a rule, companies like Bell would be more careful to create and maintain contemporaneous records (rather than just professing to do so, as Bell does now), and the task of the lower courts in future interference cases would be greatly simplified.

Petitioner has shown in Section A, above, that the lower courts are in hopeless conflict over the proper rule in this area. We submit that this Court should grant certiorari here in order to resolve that conflict and, at the same time, to establish a new rule that would limit large, patent-wise corporations to contemporaneous, documentary evidence in their efforts to establish priority of inventive efforts. Such a rule would implement the congressional intent and the public policies that underlie the patent field, and would streamline judicial administration in this important and frequently litigated area of the law.

exist either to protect the reliability of the trial process or to ensure some greater public benefit or avert some greater harm. See, e.g., *Mapp v. Ohio*, 367 U.S. 643 (1961); *Brown v. Financial Service Corp. Int'l*, 489 F.2d 144 (5th Cir. 1974); *Bailey v. Kawasaki-Kisten, K.K.*, 455 F.2d 392, 395-396 (5th Cir. 1972); *United States v. Georgia-Pacific Co.*, 421 F.2d 92 (9th Cir. 1970); *Vockie v. General Motors Corp.*, 66 F.R.D. 57 (E.D. Pa.), *aff'd*, 523 F.2d 1052 (3d Cir. 1975).

CONCLUSION

We respectfully urge the Court, for all of the reasons set forth above, to grant certiorari and to reverse the decision below.

Respectfully submitted,

E. BARRETT PRETTYMAN, JR.
 ALLEN R. SNYDER
 ROYAL DANIEL
 WALTER A. SMITH, JR.
 815 Connecticut Avenue, N.W.
 Washington, D.C. 20006

DUGALD S. MCDOUGALL
 MELVIN M. GOLDENBERG
 135 South LaSalle Street
 Chicago, Illinois 60603

ROBERT THOMPSON
 Hughes Aircraft Company
 5150 West Century Boulevard
 Los Angeles, California 90009

Attorneys for Petitioner

APPENDIX

1a

UNITED STATES DISTRICT COURT
D. DELAWARE

Civ. A. No. 74-238

BELL TELEPHONE LABORATORIES, INCORPORATED,
Plaintiff,

v.

HUGHES AIRCRAFT COMPANY and
GENERAL INSTRUMENT CORPORATION,
Defendants.

July 19, 1976

Richard F. Corroon, and Peter M. Siegloff, of Potter, Anderson & Corroon, Wilmington, Del. (Albert E. Fey, and Robert C. Morgan, of Fish & Neave, Edward Dreyfus, New York City, Peter V. D. Wilde, Murray Hill, N.J., of counsel), for plaintiff.

Thomas S. Lodge, of Connolly, Bove & Lodge, Wilmington, Del., Dugald S. McDougall, and Melvin M. Goldenberg, of McDougall, Hersh & Scott, Chicago, Ill. (Robert Thompson, Los Angeles, Cal., of counsel), for defendant Hughes Aircraft Co.

OPINION

(Filed July 19, 1976)

Wright, Senior Judge.

Plaintiff, Bell Telephone Laboratories, Inc. ("BTL"), seeks relief under 35 U.S.C. Sec. 291¹ against defendants Hughes Aircraft Co. ("Hughes") and General Instruments Corp. ("G.I."). BTL alleges that an interference exists between its United States Letters Patent Number 3,475,234 (the Kerwin patent), and United States Letters Patent Numbers 3,544,399 (the Dill patent) and 3,576,478 (the Watkins patent), owned by Hughes and G.I. respectively. BTL seeks an adjudication of that interference and a declaration that it is the sole owner of the patent rights in interference.

This Court has jurisdiction under 28 U.S.C. Sec. 1338 (a). Since plaintiff, BTL, is a New York corporation and both defendants are Delaware corporations venue is proper under 28 U.S.C. Sec. 1391(c). Cf., *Standard Oil Co. v. Montecatini Edison, S.p.A.*, 342 F.Supp. 124 (D.Del. 1972).

Previously this Court has entertained a suit in which Hughes charged General Instruments with infringement of the Dill patent. General Instruments defended on the grounds, inter alia, that the Dill patent was invalid by reason of Watkins' prior invention. After separate trial on this priority issue, this Court held that although Watkins had conceived the invention in March of 1965, Watkins did not reduce the invention to practice until the filing of a patent application on November 17, 1966.

¹ 35 U.S.C. Sec. 291 provides:

The owner of an interfering patent may have relief against the owner of another by civil action, and the court may adjudge the question of the validity of any of the interfering patents, in whole or in part. The provisions of the second paragraph of section 146 of this title shall apply to actions brought under this section.

Dill, however, was found to have conceived on May 1, 1966, and to have reduced to practice constructively by the filing of a patent application on October 26, 1966. Since Watkins was the first to conceive but the last to reduce to practice, his diligence from Dill's conception until his own filing was necessary to a finding that he was the prior inventor. No such diligence was found and Hughes prevailed. *See Hughes Aircraft Co. v. General Instruments Corp.*, 374 F.Supp. 1166 (D.Del. 1974). Before further proceedings on the remaining validity and infringement issues in that case occurred, the present suit was filed by BTL.

At an early stage in these proceedings, Hughes moved for dismissal on the ground that no interference existed. This Court was unwilling to hold on the record then extant that the patents were non-interfering. Accordingly that motion was denied. 185 U.S.P.Q. 660. G.I. participated in the briefing of that motion and urged that a three-way interference existed. However, as a result of a settlement agreement with Hughes, G.I. ceased participating in these proceedings prior to the argument on the Hughes' motion. *See* 185 U.S.P.Q. at 661.

Following denial of the dismissal motion, Hughes dropped its position that the Kerwin and Dill patents were non-interfering and the case proceeded to trial on the merits. The matter is now ready for decision.

The purpose of a suit under 35 U.S.C. Sec. 291 is to establish priority of invention as between patentees. Priority is determined by the standard found in 35 U.S.C. Sec. 102(g):

... In determining priority of invention, there shall be considered not only the respective dates of conception and reduction to practice, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.

In the instant suit, the parties have stipulated to the Hughes dates determined by this Court in the Hughes v. General Instrument infringement action.² The parties therefore presented this Court with proofs only respecting BTL's dates of conception and reduction to practice. In the event that the Court were to determine that the Kerwin invention was conceived prior to May, 1966, and reduced to practice after November 17, 1966, BTL also sought to show that the Kerwin inventors exercised diligence from prior to May, 1966 until such time as they had achieved a reduction to practice.³

The invention in the priority contest is directed to a semi-conductor device known as a "silicon-gate field effect transistor". ("SGFET"). A field effect transistor ("FET") is a three-electrode electronic amplifier formed in a small semi-conductor. The semi-conductor is usually silicon and is referred to as a "slice", "chip", or "wafer". The three electrodes are known as the "source", "drain", and "gate". The source and the drain electrodes are formed in the silicon wafer by "doping" selected portions of the wafer with selected impurities. The area separating the source and drain is known as the "channel", and normally will resist the flow of current. However, in an FET, the channel is overlaid with an insulating layer, and the gate electrode is formed on top of that layer.

² The Dill invention was conceived on May 1, 1966, and reduced to practice with the filing of the patent application on November 17, 1966.

³ BTL did not attempt to prove a date of conception prior to March of 1965, the date of conception awarded to G.I. 374 F.Supp. 1171. However, since BTL was not a party to the prior suit, it is not bound by any of this Court's findings in that action. Further, there was no attempt here to establish G.I.'s March 1965 date. Accordingly, this Court need not address the issue of whether, under 35 U.S.C. Sec. 102(g), a March 1965 conception by G.I. would moot the issue of BTL's diligence, assuming BTL conceived before Hughes, but after March 1965, and reduced to practice after November 17, 1966.

When an appropriate voltage is applied to this gate, current is able to flow along the previously resistant path between the source and drain. Further, variations in the voltage applied to the gate will result in variations in the current flowing between the source and drain.

Prior to the development of the invention in suit, a major problem in fabricating these devices was the positioning (or alignment) of the gate electrode. The devices are of very small dimensions and it was desirable to make them even smaller. It accordingly was very difficult to align precisely a strip of metal (usually aluminum) on top of the insulator which overlaid the channel separating the source and drain.

The SGFET avoided this alignment problem completely by virtue of its so-called "self-alignment" feature. To effect self-alignment, a silicon layer is positioned over the insulating layer covering the channel on the chip prior to forming the source and drain regions. The doping or diffusion step which results in formation of the source and drain is then performed. The silicon acts as a "mask" during this step and prevents doping of the channel region. The source and drain are thus formed precisely at the edges of the silicon gate, and the gate itself becomes sufficiently doped to become a conductor and thus act as an electrode.

This sequence, performing the diffusion step after placement of the gate electrode, had been impossible using the prior art, for the metal gates, usually aluminum, would melt at the temperatures required for diffusion. The Work At Bell Telephone Laboratories.

Work on a SGFET by the Kerwin⁴ group can be traced to a meeting held at BTL in February, 1966. The

⁴ The named inventors on the BTL patent are Robert E. Kerwin, Donald L. Klein and John C. Sarace. At all relevant times, Klein was supervisor of the group which included Kerwin and Sarace. (PX-3; T-43-44, 275, 680) Since Kerwin was the first-named inventor, the Court as a matter of convenience uses the terms "Kerwin group" and "Kerwin invention".

meeting was called by Donald Klein, and was attended by members of his research group, as well as by other BTL technical personnel. Kerwin and Sarace were among those attending the meeting. (T-49, 278, 680)

The purpose of the meeting was to discuss problems which arose in making integrated circuits composed of large numbers of solid state devices. A significant problem respecting "yields" was always present in the manufacture of the circuits in a multi-step process. Even when each step in a process was highly efficient and resulted individually in a high yield, after a sequence of many such steps had been performed on a given device array, the percentage of operative devices in the area would be unsatisfactorily low. To overcome this problem, Klein hoped that his group would be able to come up with a so-called "go, no-go" sequence of device fabrication steps. A sequence of "go, no-go" process steps could approach 100% efficiency for it envisaged the use of materials which either would or would not be subject to reaction in a given chemical process step. (T-45-47; 49-50)

During the course of this meeting, at which a variety of potential process steps were discussed, Kerwin came to the key realization that placement of a thermally resistant gate prior to doping of the source and drain regions would eliminate the problems encountered in aligning the gate electrode. (T-280-85) Silicon, a material with which the group had experience, was the thermally resistance material chosen. (T-286) The SGFET fabrication process which resulted from this meeting was recorded by Klein (PX-10). Somewhat later, in early March, following discussion between Klein and his superior Hugh M. Cleveland, the latter developed a chart detailing the work assignments that would be involved in carrying out the project. (PX-15; T-576-77) In

summary, the fabrication sequence involved the following steps:⁵

1. Preparation of a silicon chip. This step, while rather involved and time consuming, is only the preparation of starting materials. It does not relate directly to the invention.

2. Deposition of an insulating layer on the upper surface of the chip. The parties disagree on which insulating materials were initially embraced by the Kerwin group. Without question, silicon nitride was the insulator of choice by those at the February meeting. The contemporaneous evidence, however, convinces this Court that silicon nitride was not the only insulator considered. Reference to silicon nitride was somewhat equivocal, e.g., Klein's notes (PX-10) in reference to this insulating layer, contains the notation "(Si₃N₄?)" and Cleveland's notes (PX-15) expressly indicate that an alternative to silicon nitride was considered. This alternative insulator was a layer of silicon oxide over the silicon, followed by a layer of silicon nitride. This two layer insulating medium is referred to as a "sandwich". See Fig. 1, Appendix.

3. Deposition of a layer of silicon oxide on top of the insulating layer. See Fig. 2, Appendix.

4. The selective etching away of the silicon oxide layer from the surface of the chip. This etching was to be effectuated by a so-called photoresist technique. The photoresist technique is used to place a plastic film over a portion of the surface of the device.⁶ The plastic film

⁵ The following enumeration of steps is somewhat arbitrary. Further, the list is not all inclusive; steps of minor relevance to the discussion have been deleted. This fabrication sequence is also found in the Kerwin patent. (PX-1)

⁶ This technique, old in the art, involves coating the entire surface of the chip with a plastic material having photochemical properties. A photographic "mask" containing appropriate apertures could then be placed over the surface. The masked chip is

then functions as an etch mask for the subsequent removal of undesired portions of the underlying silicon oxide layer. *See* Fig. 3(A), Appendix. This is possible because certain agents which will dissolve silicon oxide, e.g., ammonium bifluoride, will be unreactive to the plastic film. Further, the ammonium bifluoride will have little effect on the underlying silicon nitride layer—thus in the jargon of the BTL group, the etch process would be “go, no-go”—go as to the silicon oxide and no-go as to the silicon nitride.

The remaining portions of the photoresist material are then removed. *See* Fig. 3(B), Appendix.

5. Deposition of a silicon layer across the entire surface. *See* Fig. 4, Appendix.

6. Placement of a plastic film by photoresist procedure over selected portions of the silicon layer, followed by etching away of a portion of the silicon layer with a mixture of hydrofluoric, nitric and acetic acids saturated with iodine. This mixture has little effect on the layers underlying the silicon. Subsequently the plastic film is removed by suitable solvent. *See* Fig. 5, Appendix.

7. Removal of exposed silicon oxide by use of ammonium bifluoride which will remove exposed SiO_2 , but have little effect on silicon or silicon nitride. *See* Fig. 6, Appendix.

8. Removal of the silicon nitride layer by use of hot phosphoric acid, a solvent to which the underlying silicon or, in the case of the sandwich, silicon oxide, is impervious. In the case of the sandwich, underlying silicon oxide must then also be removed, again using ammonium bi-

then exposed to light, the light being allowed to strike only those areas of the chip on which it is desired to have the plastic film remain. Following exposure to light, the unexposed portions of the plastic film are removed with an appropriate organic solvent, with the exposed portions of the plastic film remaining intact.

fluoride. In these etch steps, the silicon gate functions as an etch mask over the underlying insulator. These etch steps are followed by the diffusion or “doping” step, which results in formation of the source and drain electrodes. During this latter procedure, the silicon gate acts as a diffusion mask. *See* Fig. 7.

9. Metallization. This step involves placement of metal on the electrode surface. This is required in order to facilitate attachment of wires to the device.

Following the February meeting, BTL investigators immediately began to try to produce field effect transistors using the newly devised fabrication sequence. Many of the individual steps in the process, however, were time-consuming, though routine. Accordingly, the first semi-completed devices were not tested until late May or early June of 1966. The devices which were then tested employed a single silicon nitride layer, and not the sandwich, as a gate insulator. Further, these devices were not “metallized”. That is, the devices did not have metal covering the electrode surfaces for the attachment of wire leads.

Accordingly, the devices were tested using a so-called probe test.

A probe test involves the physical placement of wires against the electrode surfaces—the physical placement being facilitated by holding the device array in a clamp and moving wire probes with a micrometer-like screw down onto the appropriate surface locations. The operator performing the test peers through a microscope while making contact to ascertain that the wires are being held against the desired electrode. (T-194-99)

The late May-early June probe tests of the nitride devices were clearly successful. The tests showed a “transistor effect”, i.e., they showed drain-to-source current as a function of drain-to-source voltage for different ap-

plied gate voltages, which curves were within a commercially accepted range; and the tests showed this result was true for a high proportion of the devices tested. (PX-24)

After the probe tests were performed, Sarace attempted to metallize the devices. The conventional procedure would have been to use a so-called "aluminization" process. The parties agree that such a process would have been routine and its effectuation would have been within the purview of one of ordinary skill in the art.⁷ Sarace, however, elected to perform a "platinization" procedure.⁸ This procedure was somewhat experimental but was also a more rapid and convenient procedure. (T-81, 151).⁹ Unfortunately for Sarace, the platinization procedure, which was performed in late June 1966, produced only "shorted" devices. (PX-16 at 56; T-741-42)

Up until this time, work on the silicon gate project had required the efforts of several individuals. From this time on, however, Sarace was the only BTL employee to be assigned essentially full-time to the project. (T-703-03, 732, 788) Following the failure with platinization,

⁷ Although Dietrich A. Jenny, testifying for Hughes, agreed that the process itself would have been routine, he testified, in effect, that the outcome could not have been predicted with certainty. (T-880-81, 888)

⁸ Sarace did not actually perform the platinization step himself. That procedure was performed by others at BTL at his request. (See Dx-16 at 16; T-691-92.) Similarly, an aluminization would have been performed by others. (T-714)

⁹ The platinization procedure in essence involved the vacuum deposition of metallic platinum over the surface of the device followed by a heat treatment. The heat would convert any platinum over silicon into platinum silicide, a conductor. Following this formation of platinum silicide over exposed silicon, the wafer could be washed with aqua regia to remove unreacted platinum. (T-79-81, 347-48) In contrast, an aluminization procedure would be more time consuming for it would involve photolithographic masking operations.

Sarace did not immediately switch to a conventional metallization procedure. Rather, he performed a microscopic examination of the shorted device in an effort to determine the source of the shorts. This examination failed to reveal the source of the shorts, but it did disclose an over-etching step. (PX-16 at 56) Although this over-etching had apparently not been exemplified in prior tests of the electrical characteristics of the devices, Sarace proceeded with a series of tests aimed at developing more precise etching-step parameters. This phase of Sarace's work continued into August of 1966. In addition, Sarace worked on several other problems affecting the devices.¹⁰

During the course of his work on these problems, Sarace became aware of a further problem, a hysteresis effect on the devices having a silicon-to-silicon nitride interface.¹¹

Hysteresis can be considered a type of electrical instability.¹² While hysteresis did not make these devices totally unsatisfactory, it was a deficiency which it was desirable to overcome. Accordingly, Sarace directed his efforts to overcoming the hysteresis problem. A solution to the hysteresis problem was somewhat elusive. Sarace's

¹⁰ These problems included, *inter alia*: (1) overly high "P-channel thresholds" initially thought to be caused by improper cleaning techniques, but which were solved by use of a hydrogen anneal (T-710-11); and (2) the failure of the photoresist material to adhere properly to silicon. (T-709)

¹¹ Sarace explored this hysteresis effect using capacitors rather than SGFET's as a test vehicle. This was because capacitors containing a silicon-to-silicon nitride interface were easier to fabricate than were SGFET's, and tests of the electrical properties of such capacitors could be extrapolated to SGFET's. (T-712, 773-74)

¹² The hysteresis was exemplified by a displacement in plots of gate capacity vs. gate voltage which was observed when a plot that had been made while increasing voltages was compared with a plot made immediately thereafter, while decreasing voltages. See, e.g., PX-42 at 7.

notebook (PX-16) indicates that up until October 17, 1966 no solution to the hysteresis problem had been found.

There are no entries from October 17, 1966 until January 17, 1967 in the laboratory notebook of Sarace, the only BTL employee then devoting full-time to the SGFET project. The activities at BTL during this period are not recorded on a day-to-day basis and, therefore, must be gleaned from (1) the testimony of Sarace and others;¹³ and (2) certain other supporting documents. The earliest dated documents showing a solution to the hysteresis problem are in form of viewgraph slides (PX-42) which were prepared in conjunction with a talk that Sarace gave at a meeting with another group of BTL workers in Allentown, Pennsylvania. This meeting was held December 9, 1966 (T-793), and the viewgraphs were presumably prepared shortly before that date. These viewgraphs slides show that sometime prior to December 9, Sarace had employed the so-called "sandwich" construction and that this construction had resulted in elimination of the hysteresis problem.

Another document which supports a November date of completion for a SGFET utilizing the sandwich construction is a memorandum dated January 5, 1967 (PX-48) sent from Mr. Biondi, the director of the electron device laboratory to Mr. Cave of the BTL Patent Department. Although the memorandum is over Mr. Biondi's signature, it was actually written by Kerwin. (T-326) This memorandum indicates that subsequent to a prior memorandum dated November 15, 1966 (PX-35), the "sandwich" process was employed; that the sandwich

¹³ Klein testified to contact with Sarace during the period in which Sarace was the only BTL inventor working full-time on the silicon gate project. (T-166, 174) There was also testimony by other workers at BTL who had some minor recollection of contact with Sarace in connection with the SGFET project in the fall of 1966. *See, e.g.*, testimony of Roger Edwards. (T-503 D-504)

process improved electrical stability; and that sandwich-containing devices were undergoing life tests.

In life tests, the devices are subject to stress conditions, e.g., elevated temperatures, and periodically data is gathered from the devices to check for changing electrical characteristics; that is, the devices are placed in a furnace and removed at given intervals for electrical testing, then returned to the furnace for a further time interval. These life tests are used to indicate the "stability" and "reliability" of the devices. (T-152, 321-22) Also they would show whether a device would "last long enough to be useful". (T-231) These tests required, as a practical matter, that the devices first be metallized. (T-152, 714)

Not until January 1967 did the Patent Department at BTL commence preparation of a patent application directed to the Kerwin invention. The application was filed March 27, 1967.

The Existence Of An Interference

Although Hughes at one time acceded to BTL's position that an interference existed, the Court expressed reluctance to accept a stipulation on this question. Since the question of whether an interference exists may, in a Sec. 291 suit, be characterized as going to the Court's subject matter jurisdiction, the Court deemed it inappropriate for the parties to stipulate to the matter. The Court asked the parties to address themselves anew to the question of the existence of an interference in their post-trial briefs.

Hughes again contends that no interference exists, but the Court is of the view that the evidence in the record unequivocally supports the existence of an interference. As this Court noted in denying Hughes' dismissal motion, the allegedly interfering claims of the Dill and the

Kerwin patents differ in only one respect—the process claimed in the Dill patent recites a step of “etching away the exposed portions of said insulating layer”, while the corresponding step in the Kerwin patent reads “etching away the exposed portions of said insulating layer using said silicon layer as a mask”. (emphasis added). See 185 U.S.P.Q. at 661.

However, in Dill's original Invention Disclosure which he submitted to the Hughes' Patent Department, he referred to the use of the “Si layer as a mask”. (Pretrial Order Par. 27). Further, the parties agree that Dill correctly testified before this Court in the Hughes v. General Instruments trial that his invention did not require a separate masking step and that those skilled in the art would recognize that the silicon gate itself acted as an etch mask. (Pretrial Order Par. 33). Thus, this Court is satisfied that Claim 1 of the BTL patent and Claim 5 of the Hughes patent are, in fact, interfering.

After trial, Hughes advanced two additional arguments in support of the view that the patents were not interfering. First, Hughes contended that if the Dill process were modified to include the deposition of metal on top of the silicon gate, then that metal, and not the silicon, would act as an etch mask. There is no testimony or suggestion in the record, however, that indicates the Dill process has never been so practiced. Further, it is not evident to this Court that even if the process were so practiced that the metal would perform as the mask to the exclusion of the underlying silicon. Second, Hughes contended that the use of silicon as an etch mask in the Kerwin process refers to the use of silicon as a mask for the field oxide layer, which layer is lacking in the Dill process. Again, since the issue was raised after trial, the Court has no testimony in support of this view. However, as this Court understands the Kerwin process, the fact that silicon may act as

an etch mask for the field oxide does not diminish the fact that the silicon gate also inevitably serves as an etch mask with respect to the gate insulator. Accordingly, the Court finds that an interference for purposes of Sec. 291 does, in fact, exist.

Conception.

A “conception is the mental part of the process in arriving at invention”. *Electro-Metallurgical Co. v. Krupp Nirosa Co.*, 122 F.2d 314, 318 (3rd Cir. 1941). Conception is not, however, merely “the perception or realization of the desirability of producing a certain result; rather it is the perception or realization of the means by which the result can be produced.” 1 *Rivise and Caesar, Interference Law and Practice* Sec. 110 (1940). Further, this mental possession of the means must be such that completion or effectuation of the invention requires no more than routine skill. Accordingly, the need for extensive subsequent research will negate an earlier asserted date of conception. See *Alpert v. Slatin*, 305 F.2d 891, 894 (C.C. P.A. 1962). It is clear that at their February 1966 meeting, the BTL group did more than merely recognize a problem. Hughes argues, however, that the February conception was incomplete in that extensive research was required to reduce the February conception to practice. The BTL inventors acknowledged that at the time of the February meeting, they were uncertain of their ability to carry out certain of the process steps envisaged in their conception. See, e.g., T-287. Viewing the events after the fact, however, this Court is convinced that BTL inventors faced no problems in pursuing a reduction to practice which required the use of inventive skill. That is, while it was impossible in February 1966 to state with certainty that the BTL process would work, events would show that the process did work. Further, while the process of reducing the invention to practice was lengthy,

this was not primarily the result of extensive experimentation required for a successful reduction to practice. Many of the individual process steps, though old in the art, were quite time consuming. Further, much of the experimentation was directed to solving the hysteresis problem, a problem which in itself would not have precluded a successful reduction to practice.¹⁴ Accordingly, this Court is convinced that BTL has met its burden of proof¹⁵ respecting its entitlement to a February-March conception date.

Reduction To Practice.

"A process is said to be reduced to practice when the series of steps constituting the process are carried out in such a manner as to demonstrate the practicability of the process." *Rivise & Caesar, supra*, Sec. 131 (citing *Corona Cord Tire Co. v. Dovan Chemical Corp.*, 276 U.S. 358 (1928)). Further, in the case of a product-producing process, a reduction to practice requires the establishment of utility for the products produced by the process. See, e.g., *Tennessee Valley Authority v. Monsanto Chemical Co.*, 383 F.2d 973, 977 (5th Cir. 1957). Accordingly, the date of BTL's reduction to practice is the date on which BTL can show that it produced a useful field-effect transistor using the silicon gate process.

¹⁴ Hughes also argued that the February conception was deficient in that it did not envisage the use of the sandwich construction, which construction was ultimately used by BTL in their completed devices. As is clear from the discussion of facts *supra*, however, this Court is of the view that the sandwich construction is amply demonstrated in the documents that came out of the February meeting.

¹⁵ The Kerwin inventors, who filed their application five months after Dill, would be the junior party in the Patent Office and thus have borne the burden of proof. 37 C.F.R. Sec. 1.257. Although it is not clear that the burden should always be so allocated in a Sec. 291 proceeding, where as here the junior party is also plaintiff, this Court has no burden concluding that such party should bear the burden of proof.

BTL contends that such a reduction to practice was shown by the probe tests in the period of late May to early June 1966. Hughes contends that the probe tests involved less than completed devices and, as such, they were insufficient to demonstrate a reduction to practice.¹⁶

There are a multiplicity of opinions dealing with the question of whether or not a given laboratory or bench test constitutes a reduction to practice in a particular case. See, e.g., *Rivise & Caesar, supra*, Sec. 143 and Sec. 144. The frequently stated rule is that "a test under service conditions is necessary in those cases, and in those only, in which persons qualified in the art would require such a test before they are willing to manufacture and sell the invention, as it stands." *Sinko Tool & Manufacturing Co. v. Automatic Devices Corp.*, 157 F.2d 974, 977 (2d Cir. 1946).

While this Court is convinced that the May-June 1966 probe tests constituted a successful intermediate experiment, BTL has failed to establish that those tests demonstrated that the devices possessed the utility required for a reduction to practice. The testimony of BTL's own inventors was that life tests of completed devices were necessary in order to demonstrate that the devices were reliable and useful.¹⁷ These life tests establishing a reduction to practice were not completed until December 1966-January 1967.

¹⁶ It is Hughes' position that a metallized device is a prerequisite to reduction to practice, notwithstanding the fact that the claims of the Kerwin patent do not encompass a metallization step, and that metallization was an established art.

¹⁷ BTL urges that this Court's opinion in *Hughes Aircraft Co. v. General Instruments, Inc.*, 374 F.Supp. 1166, implies that successful, corroborated probe tests of an SGFET will suffice for a reduction to practice. This Court does not, however, read its prior opinion as so holding.

Diligence.

Since BTL has established a date of conception prior to Dill's date of conception but has established a date of reduction to practice subsequent to Dill's date of reduction to practice, BTL can prevail only if the Kerwin group is found to have exercised reasonable diligence from just prior to Dill's conception up until their reduction to practice in December 1966-January 1967.

"The party chargeable with diligence must account for the entire period during which diligence is required." *Gould v. Schawlow*, 363 F.2d 908, 919 (C.C.P.A. 1966). Further, in making such account, the testimony of the inventor alone is usually deemed insufficient. *Id.* at 919; *Sletzinger v. Lincoln*, 410 F.2d 808, 812 (C.C.P.A. 1969).

There is no question that the Kerwin inventors were diligent from the time of their February-March 1966 conception up until the time of the probe tests in May-June 1966. In the second half of 1966, however, Sarace was the only inventor devoting full time to the project and his records show a substantial void, from October 17, 1966 until January 17, 1967. Sarace testified that it was in this period that he returned to the "sandwich" conception, and constructed and tested such a device, though his notes do not reflect this. However, certain other evidence does corroborate Sarace's testimony of fulltime efforts on the SGFET.

On December 9, Sarace presented viewgraphs with test data from sandwich devices to a meeting at Allentown, and this indicated that BTL workers had completed fabrication of these devices by late November 1966.¹⁸ Further, the January 5, 1967 Biondi memoran-

¹⁸ Such date would be required in order for Sarace to test the devices and prepare for the December 9 presentation. As indicated by the November 15, 1966 and January 5, 1967 Biondi memorandum (PX-35 and 48), sandwich devices had not been constructed before mid-November 1966.

dum (PX-48) indicates that the time-consuming life tests were then underway.

While a day-to-day corroboration of Sarace's testimony regarding his activity during the fall of 1966 would be desirable, this Court concludes that its absence is not fatal to BTL's case. It is sufficient that BTL has established by competent evidence an inference more reasonable than not that work on the silicon gate process continued uninterrupted from prior to Dill's date of conception until completion of the life tests which constituted a reduction to practice. The Court thus finds that BTL has met its burden of proof regarding the exercise of reasonable diligence.¹⁹

Accordingly, BTL is declared to be prior inventor of that subject matter common to the Dill and Kerwin patents.

Submit order.

¹⁹ Hughes argued vigorously that the time spent by Sarace pursuing a solution to the hysteresis problem should not be credited toward reasonable diligence. This Court does not agree. Although there is authority in support of the view that diligence respecting one element of a combination is not diligence respecting the use of that element in combination with another, *Riche v. Permutit Co.*, 47 F.Supp. 275 (D.Del. 1942), that authority is not applicable here. In this Court's view, the silicon gate process, as it existed in the fall of 1966, cannot be readily subjected to rigid compartmentalization. Accordingly, Sarace's work on problems inhibiting commercial utilization of the process should be deemed reasonable diligence, whether that work encompassed the whole of the process, one step in the process, or an ultimately abandoned step.

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APPENDIX

FIGURE 1



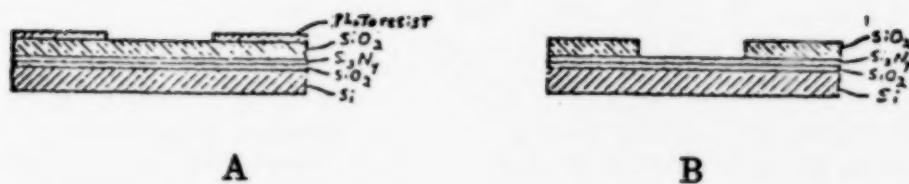
Schematic representation of (A), silicon (Si) chip on which a silicon nitride (Si_3N_4) layer has been deposited and (B), silicon chip on which a silicon oxide (SiO_2) layer has first been deposited, followed by a silicon nitride layer. Figure 1B represents the so-called sandwich construction. It is that construction which is depicted in all of the following figures.

FIGURE 2



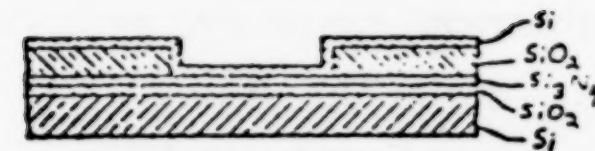
Schematic representation of device following completion of step 3.

FIGURE 3



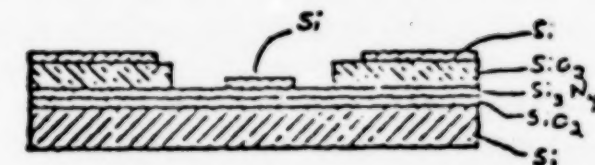
21a

FIGURE 4



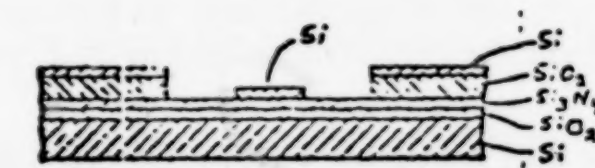
Schematic representation of device following step 5.

FIGURE 5



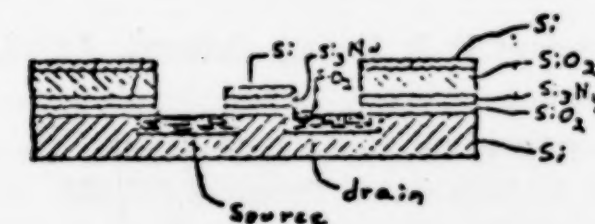
Schematic representation of device following step 6.

FIGURE 6



Schematic representation of device following step 7.

FIGURE 7



Schematic representation of device following step 8.

Schematic representation of (A) device following photoresist step and (B) device following etching of SiO₂ and removal of photoresist.

FINAL JUDGMENT

(entered November 16, 1976)

This action under 35 U.S.C. Sec. 291 was filed November 11, 1974. At a hearing on March 17, 1975, defendant General Instrument Corporation represented in open Court that it was, in effect, giving up its Watkins Patent 3,576,478 involved in this interfering patents case. Thereafter General Instrument Corporation did not participate in the trial of this action and did not offer any evidence either to establish invention dates in favor of its own patentee or to challenge the invention dates of plaintiff's patentees.

The case was tried to the Court without a jury on November 17 to 21, 1975, fully briefed, and argued on March 16, 1976. The Court delivered its Opinion on July 19, 1976, setting forth its findings of fact and conclusions of law.

By motion filed September 7, 1976, General Instrument Corporation moved to reopen the case for the purpose of entering evidence of the conception and reduction to practice dates of the Watkins invention. The Court denied General Instrument Corporation's motion in its Opinion delivered October 26, 1976.

Now Therefore It Is Hereby Ordered, Adjudged And Decreed That:

1. Plaintiff Bell Telephone Laboratories, Incorporated is owner of United States Patent 3,475,234.

2. Defendant Hughes Aircraft Company is owner of United States Patent 3,544,399.

3. Defendant General Instrument Corporation is owner of United States Patent 3,576,478, General Instrument Corporation having admitted such ownership in its pleadings.

4. This Court has jurisdiction over the parties to this action.

5. This Court has jurisdiction over the subject matter of this action as between Bell Telephone Laboratories, Incorporated and Hughes Aircraft Company.

6. United States Patent 3,475,234 and United States Patent 3,544,399 are interfering patents within the meaning of 35 U.S.C. Sec. 291.

7. Robert E. Kerwin, Donald L. Klein and John C. Sarace the patentees of United States Patent 3,475,234, are prior inventors over the patentee of United States Patent 3,544,399 of that subject matter common to those two patents.

8. This judgment is a final judgment on priority of invention adverse to the patentee of United States Patent 3,544,399.

9. This Court has jurisdiction over the subject matter of this action as between Bell Telephone Laboratories, Incorporated and General Instrument Corporation, and United States Patent 3,475,234 and United States Patent 3,576,478 are interfering patents within the meaning of 35 U.S.C. Sec. 291, General Instrument Corporation having admitted such jurisdiction and interference in its pleadings.

10. General Instrument Corporation having failed to present a defense to this action, judgment against it by default, and not based upon any findings of fact respecting the dates of conception and reduction to practice of the invention of United States patent 3,576,478, is entered herein pursuant to Rule 55(b)(2) F.R.Civ.P.

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11. This default judgment is a final judgment adverse to the patentee of United States Patent 3,576,478 as to both affirmative and defensive use of that patent.

12. Plaintiff shall recover its costs in an amount to be determined, such costs to be borne equally by defendants for the period to and including March 17, 1975 and to be borne by Hughes Aircraft Company for the period after March 17, 1975.

So Ordered this 16th day of November, 1976.

Enter: November 16, 1976
/s/ Caleb M. Wright
Senior Judge

NOTICE OF APPEAL
(Filed December 2, 1976)

Notice is hereby given that Hughes Aircraft Company, one of the defendants in the above-captioned action, hereby appeals to the United States Court of Appeals For The Third Circuit from the Final Judgment entered in this action on the 16th day of November, 1976.

By Connolly, Bove & Lodge
Farmers Bank Building
10th and Market Streets
Wilmington, Delaware 19899
Attorneys for Defendant
Hughes Aircraft Company

Of Counsel:
Dugald S. McDougall
Melvin M. Goldenberg
135 South LaSalle Street
Chicago, Illinois 60603
Robert Thompson
5250 West Century Boulevard
Los Angeles, California 90009

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UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

No. 77-1061

BELL TELEPHONE LABORATORIES, INC.

v.

HUGHES AIRCRAFT COMPANY and GENERAL
INSTRUMENT CORPORATION

HUGHES AIRCRAFT COMPANY,
Appellant

APPEAL FROM THE UNITED STATES DISTRICT COURT FOR
THE DISTRICT OF DELAWARE
(District Court Civil Action No. 74-238)

Argued September 6, 1977

Before SEITZ, *Chief Judge*, MARIS and GIBBONS,
Circuit Judges

Dugald S. McDougall
Melvin M. Goldenberg
Chicago, Ill.
Thomas S. Lodge
Wilmington, Del.
Robert Thompson
Los Angeles, Cal.

Attorneys for Appellant

Albert E. Fey
 Robert C. Morgan
 Fish & Neave
 New York, N.Y.
 Edward Dreyfus
 New York, N.Y.
 Richard F. Corroon
 Potter, Anderson & Corroon
 Wilmington, Del.
 Peter V. D. Wilde
 Murray Hill, N.J.

Attorneys for Appellee

OPINION OF THE COURT

(Filed October 25, 1977)

MARIS, *Circuit Judge*

This is an appeal by Hughes Aircraft Corporation (herein "Hughes") from a final judgment of the district court in favor of the plaintiff in an action brought by Bell Telephone Laboratories, Inc. (herein "Bell") against Hughes and General Instrument Corporation to establish priority of invention as among their conflicting patents. Judgment by default having been entered against General Instrument Corporation, it is no longer involved in the case. Bell and Hughes hold interfering patents claiming the same invention, the Bell patent being Patent No. 3,475,234 applied for March 27, 1967 by Robert E. Kerwin, Donald L. Klein and John C. Sarace and issued October 28, 1969 to Bell as assignee, and the Hughes patent being Patent No. 3,544,399 applied for October 26, 1966 by Hans G. Dill and issued December 1, 1970 to Hughes as assignee. The judgment of the district court awarded

priority of invention to Bell over Hughes and it is that determination which Hughes attacks on this appeal.

The invention involves a process for manufacturing a type of electronic amplifying device commonly known as a silicon gate field effect transistor. Hughes concedes, and the district court found, that the invention was conceived by Bell's inventors in the period February-March 1966 and that Dill, the Hughes inventor, did not conceive the invention until May of that year. However, the parties also agree and the district court found that reduction to practice of Dill's invention took place not later than October 26, 1966 when he filed his patent application, whereas Hughes contended and the court found that reduction to practice of the Kerwin, Klein and Sarace invention did not take place until the period December 1966-January 1967. Therefore, in order to establish its claim to priority Bell sought to prove that it had exercised reasonable diligence in reducing the invention to practice.¹ The district court after considering the voluminous evidence offered on this issue found as a fact that Bell had exercised reasonable diligence in this regard during the significant period of time, May to December 1963, and awarded priority of invention to Bell. A more detailed description of the facts is contained in the opinion filed by Judge Wright in the district court, 422 F. Supp. 372, and need not be repeated here. Whether the finding of reasonable diligence was

¹ 35 U.S.C. § 102 provides:

A person shall be entitled to a patent unless—

...

(g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.

erroneous is the specific issue which Hughes raises on this appeal.

The appellant accepts, as it must, the fact that Rule 52(a) F.R.C.P. requires this court to affirm the findings of fact of the district court unless we can say that they are clearly erroneous. Whether reasonable diligence has been exercised is a question of fact. *Electro-Metallurgical Co. v. Krupp Nirosa Co.*, 122 F.2d 314, 317 (3d Cir. 1941), *cert. denied*, 314 U.S. 699 (1942). Hughes contends, however, that the application of Rule 52(a) must be modified in this case and presents three arguments in support of that contention. First, it argues that the district court misconceived and misapplied the applicable legal standard as to what work constitutes reasonable diligence in such a situation. It is doubtless true that work quite unconnected with the reduction of an invention to practice cannot be considered.² But whether particular work is sufficiently connected with the invention to be considered to be in the area of reducing it to practice must be determined in the light of the particular circumstances of the case which may be as varied as the mind of man can conceive. It is thus peculiarly a question of fact for the finder of the facts to determine in the light of those circumstances. Here the district court found that the work performed by Bell was sufficiently within that area to constitute reasonable diligence. Our consideration of the record satisfies us that this finding was not erroneous, let alone clearly so.

The appellant next urges that as a matter of law Bell should not be found diligent in view of the fact that after June 1966 it cut back the number of staff members assigned to work on the invention. As to this, the record shows, and the district court found, that probe testing in

² *Riche v. Permutit Co.*, 47 F. Supp. 275 (D. Del. 1942), *affirmed per curiam*, 135 F.2d 922 (3d Cir. 1943), upon which the appellant relies, was such a case.

June 1966 indicated that the device produced by the process of the invention functioned successfully. What remained was the work of developing the process to a point where it would produce a commercially usable device, a task which did not necessarily require the work of as many staff members. Here again the question was one of fact for determination by the fact finder. We see no error in the district court's resolution of it.

Finally, the appellant urges that the district court should not have considered as evidence of reasonable diligence the oral recollection of the inventors uncorroborated by documentary evidence. While it has been held that the uncorroborated testimony of an inventor on essential issues of priority is highly suspect and such testimony should, therefore, generally be supported by corroborating evidence, *Campbell v. Spectrum Automation Co.*, 513 F.2d 932, 937-938 (6th Cir. 1975); *Gould v. Schawlow*, 363 F.2d 908, 919 (CCPA 1966), the corroborating evidence need not take any particular form, *MacMullen v. Santelli*, 326 F.2d 1008, 1013 (CCPA 1964), but may be either documentary or oral, *Allen v. Blaisdell*, 196 F.2d 527, 529, 531 (CCPA 1952). Since the function of the corroborating evidence is to assist the fact finder in deciding whether the inventor's testimony is credible, the question whether its amount and quality is adequate for that purpose is peculiarly for the fact finder to pass upon in the light of the circumstances of the case. *Mathieson Alkali Works v. Crowley*, 138 F.2d 281, 282 (D.C. Cir. 1943); *Bennett v. Serota*, 477 F.2d 1385, 1390-91 (CCPA 1973). Here the district court found that the testimony of the Bell inventors as to their work in reducing their invention to practice was sufficiently supported by corroborating evidence to be credited. We find no error in this regard.

In sum, we conclude from our examination of the record in this case that the district court did not err in its finding that Bell was reasonably diligent in reducing

its invention to practice. Accordingly, its determination that Bell as first inventor is entitled to priority for its patent must be sustained. Our conclusion makes it unnecessary for us to consider Bell's alternative contention in support of affirmance that it reduced its invention to practice in June 1966 when it made its successful probe tests, a date prior to Hughes' reduction to practice.

The judgment of the district court will be affirmed.

A True Copy:

Teste:

Clerk of the United States
Court of Appeals for the
Third Circuit.